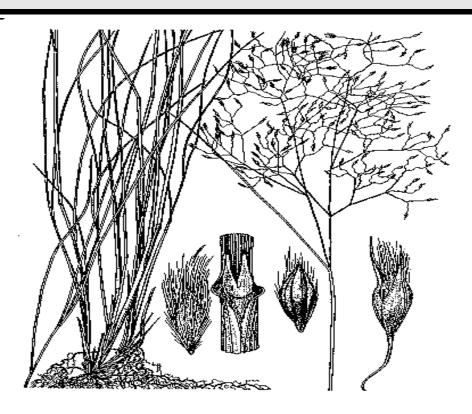
ABERDEEN PLANT MATERIALS CENTER 1998 PROGRESS SUMMARY



U.S. Department of Agriculture Natural Resources Conservation Service Idaho

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INTRODUCTION

This report summarizes plant science work conducted within the Aberdeen Plant Materials Center service area during 1998. The focus of the Aberdeen PMC is riparian and wetland plant and technology development; plants and establishment techniques for low precipitation rangeland; and promotion and demonstration of windbreaks and other agroforestry practices.

PROJECT ACTIVITIES

Native Bluegrass Evaluation Planting

Seed collections from Caliente, NV were planted in replicated plots in May, 1996. 'Sherman' big bluegrass and 'Canbar' Canby bluegrass are standards of comparison. Two accessions show promise for further evaluation and will be planted in 1999 to increase seed. A dormant seeding of the accessions planted in 1996 was also completed in March, 1998 to evaluate establishment under dormant conditions but was a failure due to severe soil crusting.

Hybrid Poplar Initial Evaluation

The purpose of this project is to evaluate hybrid poplar accessions currently being used in commercial production for fiber and fuel in Washington and Oregon. Presently there is no commercial production in southeast Idaho or northern Utah and this trial may identify accessions that are adapted to this region. Replicated plots were planted at the PMC in May, 1998.

Chinese Inter-center Strain Trial

The trial is an evaluation of grasses, forbs and shrubs native to northern China and inner Mongolia and was seeded in 1994. Production, plant height, cover and vigor data were collected through 1998. Identical trials are located at Bridger, MT and Pullman, WA PMCs. 'P-27' Siberian wheatgrass, 9075983 *Leymus chinensis* and 9058209 *Agropyron sibiricum* produced the most forage from these plots in 1998. A summary of five years of evaluation data is currently being prepared.

Coffee Point Inter-center Strain Trial

Coffee Point is located approximately 25 miles northwest of Aberdeen in an 8-12 annual precipitation zone. The trial was seeded in November, 1994 to evaluate grasses for adaptation and performance. Production, plant height, cover and vigor data are being collected. In 1998, 'Bannock' thickspike wheatgrass, P-27 Siberian wheatgrass and 'Nordan' crested wheatgrass produced the most forage.

Curlew Inter-center Strain Trial

This trial is located on the Curlew National Grasslands southwest of Pocatello, ID in a 12-16 inch annual precipitation zone and was seeded in November, 1992. Intermediate and thickspike wheatgrasses and alfalfa accessions were evaluated. During the five year evaluation period, 'Manska', 'Slate' and 'Rush' produced the most forage of the intermediate wheatgrass accessions. The thickspike wheatgrass accessions had difficulty in maintaining stands due to the competition from volunteer crested wheatgrass but Bannock was able to maintain forage production throughout the evaluation period. The only alfalfa accession which consistently produced forage was 'Spreador II'.

Grantsville Inter-center Strain Trial

Grantsville is located approximately 30 miles southwest of Salt Lake City, UT in an 8-12 annual precipitation zone and a region heavily infested with cheatgrass. The trial was seeded in November, 1994 to evaluate grasses and native shrubs for adaptation, performance and ability to compete with cheatgrass. Production, plant height, cover and vigor data are being collected. Hycrest crested wheatgrass, 'Nordan' crested wheatgrass and 'Vavilov' Siberian wheatgrass produced the most forage in 1998. The site was sprayed with Oust ® on December 2 to control cheatgrass and to evaluate herbicide effects on the planted accessions.

Mountain Home Air Force Base Windbreak Demonstration

This project is a cooperative, reimbursable project with the United States Air Force to install and demonstrate the value of windbreaks. Since 1996, the PMC has installed approximately 43,600 linear feet of windbreak. The five to six row windbreaks are comprised of Siberian peashrub, Rocky Mountain Juniper, Robust poplar, Austrian Pine, 'Shuberts' chokecherry and skunkbush sumac. In 1999, approximately 10,400 linear feet will be installed.

Mountain Home Air Force Base Woody Inter-center Strain Trial

This trial was established in 1991 to test woody plants for use in windbreaks in southwestern Idaho. There are 111 accessions representing 63 species. Semi-annual evaluations were conducted through 1996 to identify both released and potential plant material for adaptation. The PMC will continue to evaluate the site on a 5-10 year interval to observe long term survival and performance. The site is a valuable demonstration of woody plant material. An Idaho Plant Materials Technical Note No.29 Test Results - Woody Plant Materials for Windbreaks was completed as a result of this trial.

Idaho Army National Guard

The PMC and the South Bingham Soil Conservation District began working on a reimbursable project with the Idaho Army National Guard in 1996 to research propagation of tapertip hawksbeard and sharpleaf penstemon which are native to the Tank Training Area located south of Boise. The establishment of 3 plant testing sites to test native plant materials was completed in 1997. The purpose of the three sites is to test and demonstrate seedbed preparation and seeding techniques. The PMC is also assisting the National Guard in developing commercial seed production avenues for species they would like to establish at the training range on a large scale basis.

Lava Beds National Monument

The PMC entered into a reimbursable agreement with Lava Beds National Monument to produce seed from sulphur flower buckwheat. The PMC transplanted greenhouse grown plants into weed barrier fabric to reduce weed competition. The weed barrier material has proven to be successful in controlling weeds and conserving soil moisture. 72 pounds of seed were produced under this agreement.

Fourwing saltbush

The PMC has been evaluating fourwing saltbush for future release. Four accessions from the northern range of its adaptation have been bulked to develop material that is more winter hardy than existing releases. Currently in advanced testing and seed increase.

Winterfat

The PMC has been evaluating winterfat for future release. Four accessions from the northern range of its adaptation have been bulked to develop material that is more winter hardy than existing releases. It was discovered that native winterfat appears to hybridize with Pamirian winterfat which is native to central Eurasia. The PMC has removed Pamirian type plants from testing and seed increase plots.

Breeder and Foundation Seed Production

The Aberdeen PMC is responsible for Breeder and Foundation seed production of 17 plant releases. During 1998, the PMC had Foundation seed fields of 'Magnar' basin wildrye, 'Goldar' bluebunch wheatgrass, 'Rush' intermediate wheatgrass, 'Bannock' thickspike wheatgrass, 'Vavilov' Siberian wheatgrass, 'Paiute' orchardgrass, 'Ephraim' crested wheatgrass,

Richfield Selection firecracker penstemon and Clearwater Selection alpine penstemon. A severe hailstorm on June 25 drastically reduced seed production. Breeder fields of Bannock, Magnar, and 'Nezpar' Indian ricegrass were established in 1997 and evaluated during 1998.

Constructed Wetland Systems

Constructed Wetland Systems are designed and built to mimic a natural wetland's water purification function. It uses the wetland plants and the microbial populations associated with the roots to breakdown and remove various pollutants like nutrients, sediments, pesticides, heavy metals, and bacteria. The Riparian/Wetland Project has worked on two different types, 1) CWS to treat agricultural wastewater (irrigation and animal) and stormwater CWS to treat urban wastewater. The following CWSs have been installed or are in the process of being installed:

- * Nature Conservancy CWS Located near Hagerman, ID. This site was built to treat tailwater from the Northside Canal Co. main canal before it enters springs owned by TNC and eventually the Snake River in 1994. The site was planted in 1995 and 1996. This project is also a response to a court order to clean up irrigation return flows before they enter the middle Snake River area. This system is being used for research and demonstration.
- * Cedar Draw CWS This site is situated on property owned by the Twin Falls Canal Co. and Idaho Fish & Game Dept. The site was constructed and planted in 1996. This is a cooperative project between the Twin Falls Canal Co., University of Idaho, Idaho Fish & Game Dept., USDA NRCS Aberdeen Plant Materials Center, Idaho Power Co., and Coors Brewing Co. The site is designed and installed around an old fish hatchery. The raceways are used to test individual wetland plant species, CWS design, and management practices. This CWS is being used as a research and demonstration site.
- * H-Drain CWS Located near Paul, ID and situated on property owned by USDI-Bureau of Reclamation. The site was built and planted in 1995. This project was constructed to treat wastewater from irrigated farms in the A & B Irrigation District. The area originally fed an injection well which injected the irrigation wastewater into the Snake River Aquifer. This project is currently functioning. Evaluations are being made on a 5 year schedule.
- * **CSI CWS** This CWS is situated on College of Southern Idaho Campus in Twin Falls, ID. This system is treating geothermal water that heats the campus buildings, stormwater runoff from the city of

Twin Falls, and agricultural wastewater that enters Perrine Coulee above the city. The site was built in 1995 and planted in 1996. Water entering the CWS is about 85°F. It is used as a research and demonstration site.

- * Scarrow Dairy CWS Located on a private 900 cow dairy located near Wendell, ID. This CWS will be used to treat milkhouse wastewater, corral cleanout water, and irrigation return flows. The system will recirculate treated water, and is designed to treat water with high ammonia concentrations. The treated water will be used for irrigation of adjacent fields and to raise large mouth bass and channel catfish in one of the ponds. This project is currently being constructed.
- * City of Pocatello Stormwater CWS We are assisting the City of Pocatello in the design, construction, and planting of a Constructed Wetland System to treat stormwater that flows through the city from the surrounding watershed. The CWS encompasses about 4 acres. We advised the City in the purchase of plants, plant scheduling, and actual planting. It was planted in 1998. We are evaluating the vegetation and cooperating with the USGS in the water-monitoring plan.
- * Fairview CWS Located near American Falls, ID on the Neil Poulson farm. This CWS treats furrow irrigation wastewater from a 160-acre farm that raises grain, grass seed, and cattle. The wastewater is treated before it enters American Falls Reservoir on the Snake River. The design was based on replicated components, different plant species, and varying plant communities. We have two years of baseline data and extensive water quality data from the surrounding area. We are working with Idaho State University researchers to set up a variety of experiments from microbial populations, establishment speed, nutrient breakdown in relationship to age of the plants, PAM studies, invertebrate and vertebrate populations, and others. We are helping with design, data collection, plant selection, plant procurement, and planting.

Riparian Projects

The riparian projects are designed to test and demonstrate bioengineering structures either by themselves or in conjunction with rock structures. We are also looking at riparian area management, riparian enhancement, and riparian restoration. The main emphasis of our research is performance-tested native species, planting techniques in the arid and semi-arid west, and community maintenance. The following projects were installed or are being installed:

- * Arimo Ranch Riparian Grazing Demonstration Project Includes 4.1 mile of Marsh Cr. Located on private property. One half of the stream is excluded from cattle grazing, and one half is under a managed planned grazing system. One half of the exclosure and one half of the grazed portions have been or are being planted and/or having bioengineering structures installed. This site is being used as a research and demonstration site. This is a cooperative project between USDA-NRCS, Plant Materials Center and ID F&G. EPA 319 funds have been used to construct the exclosure.
- * Camas Creek/Larson Farms Site This site is a 10 mile section of Camas Creek located on Larson Farms north of Hamer, Idaho. Camas creek is dewatered through irrigation diversions during most of the summer months. The riparian vegetation has been removed through farming operations over the last 20 years. The soils are sands and sandy loams. Tons of sediment are eroded from the banks and washed down to the Camas National Wildlife refuge and Mud Lake. We were asked to come up with a restoration plan that would significantly reduce the amount of sediment coming off Larson Farms using a combination of rock structures and bioengineering structures. This site is a good demonstration of the feasibility of using rock and bioengineering structures to create a streambank erosion reduction design on a working farm in a semi-arid climate.
- * Stocking Ranch on the Blackfoot River This is a large ranch owned by the Idaho Fish and Game Department that has recently removed cattle from its pastures. The Upper Blackfoot River runs through the ranch and the streambanks are just starting to recover. We have installed several bioengineering structures along some of the more heavily eroding bank sections. This site is providing additional test areas for improvement of the bioengineering techniques used in the arid and semi-arid West.
- * Trout Creek Off-Center Advanced Test Site The Trout Creek O.A.T. site is the oldest riparian testing site for Aberdeen PMC. It was originally excluded from grazing in 1988. We have been testing various willow, cottonwood, and dogwood species in addition to planting methods since that time. We have also installed several bioengineering structures during a Riparian Workshop in 1995. This site has some of the best long-term data available.
- * Upper Portneuf River Demonstration Project This project is located on the upper Portneuf River near Chesterfield Reservoir in southeastern Idaho. This section of the Portneuf River, located on an active cattle ranch, was moved, straightened, and incorporated

into a canal delivery system to provide water to irrigators on the Arimo Ditch and the Downy Canal. The bank vegetation has been totally removed by cattle over the last 30 years. Our goals with this project were to restore the riparian vegetation, reduce streambank erosion, and improve fish habitat. These goals will help reestablish critical fish habitat downstream in areas that have not been straightened and defoliated. In partnership with the ranch owner, the canal company, Idaho Fish and Game, and the Interagency Riparian/Wetland Project, a series of stream barbs and bioengineering structures were installed to restore the streamside vegetation and to reduce the streambank erosion.

FIELD AND DEMONSTRATION PLANTINGS

Within Idaho and Utah, there are currently 180 field or demonstration plantings. These plantings are installed primarily on private lands in cooperation with the landowner, local soil conservation district and NRCS field office. These plantings enable NRCS to field test materials under development, promote materials that have been recently released, and to demonstrate to local planners, land users and landowners the value of the plant(s) to solve resource problems and needs. Each of these plantings is evaluated annually to determine the performance of the plant(s) under the specific soil, climate and management conditions present at the test location.

RECENTLY RELEASED PLANT MATERIALS

1998 Releases - Selected Class of certified plant material (natural track)

Juncus balticus

Railroad Valley Selection of Baltic Rush (Juncus balticus), Accession Number 9057641, for Land Resource Region (LRR) D South from Railroad Valley Wildlife Management Area, 10 miles southwest of Current, Nye County, Nevada. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Scirpus pungens

Wayne Kirch Selection of Common Threesquare (Scirpus pungens), Accession Number 9067642, for Land Resource Region (LRR) D North from Wayne Kirch Wildlife Management Area (previously known as the Scripps Wildlife Management Area), 63 miles south of Ely on Hwy 318, Nye County, Nevada. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

1997 RELEASES - Selected Class of certified plant material (natural track)

Salix pentandra

Aberdeen Selection of Laurel Willow. Intended use is for erosion and wind control in windbreaks and for landscaping.

Carex nebrascensis

Sterling Selection, Centennial Selection, Modoc Selection, and Ruby Lake Selection of Nebraska Sedge. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Juncus Balticus

Sterling Selection, Roswell Selection, and **Stillwater Selection** of Baltic Rush. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Eleocharis palustris

Mud Lake Selection, C.J. Strike Selection, Malheur Selection, and Ruby Lake Selection of Creeping Spikerush. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Scirpus acutus

Camas Selection, Hagerman Selection, Ogden Bay Selection, and Stillwater Selection of Hardstem Bulrush. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Scirpus pungens

Market Lake Selection, Fort Boise Selection, and Malheur Selection of Common Threesquare. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

Scirpus maritimus

Bear Lake Selection, Fort Boise Selection, Stillwater Selection, and Bear River Selection of Alkali Bulrush. Intended use is for erosion control, constructed wetland systems, wetland enhancement, wetland creation, wildlife food and cover, and increased plant diversity in wetland and riparian communities.

CURRENT PUBLICATIONS AND PAPERS

- Aberdeen Plant Materials Center, 1998. Annual Technical Report, March, 1999. Summary of new plant releases, project progress reports and public information activities.
- Hoag, J. Chris. 1998. Interagency Riparian/Wetland Plant Development Project 1998 progress report. USDA-NRCS Plant Materials Center, Aberdeen, ID.
- Hoag, J. Chris. 1998. Clear Lakes Grade Mitigation Wetland Monitoring report for 1997. Idaho Transportation Department, Shoshone, ID. June, 1998.
- Bentrup, G. and J.C. Hoag. 1998. The practical streambank bioengineering guide, a user's guide for natural streambank stabilization techniques in the arid and semi-arid West. Interagency Riparian/Wetland Plant Development Project. Plant Materials Center, USDA NRCS, Aberdeen, ID.
- Hoag, J.C. 1997-1998. View from a Wetland News and Technology for Riparian and Wetland Management, No. 4. Interagency Riparian/Wetland Project, USDA - NRCS, Plant Materials Center, Aberdeen, ID. 4 pp.
- Sotir, R, J.C. Hoag, and J. Harrington. 1998. Natives vs. introduced plants and natural revegetation vs. planting. American Society of Civil Engineers Wetlands Engineering and River Restoration Conference. Denver, CO. March, 1998.

- Hoag, J. Chris. 1998. Vegetation Considerations in Riparian Restoration. Practical approaches to riparian and wetland restoration: from the mountains to the plains conference. Sponsored by University of Montana, RWRP, Missoula, MT. April, 1998.
- Plant Guide Handbook, Compiled by: Daniel G. Ogle, Plant Materials Specialist, Boise, Idaho, February 1997. Summary of approximately 350 plant guides including forbs, grasses, riparian/ wetland plants, shrubs/trees, and weedy species common to the intermountain west.

Technical Notes

- 1. Seed Collection, March 1993.
- 3. Cover Crops. June 1993.
- 5. List of Improved Conservation Plant Materials Released by NRCS and Cooperators Through December 1996. April 1997.
- 6. The Stinger A Tool to Plant Unrooted Hardwood Cuttings of Willow and Cottonwood Species for Riparian or Shoreline Erosion Control or Rehabilitation. June 1994.
- 8. Alfalfa Management Guide. June 1997.
- 9. Salt Tolerance of Plants. October 1994.
- 10. Planning a Seeding. October 1994.
- 15. Idaho Noxious Weed Law. June, 1998
- 18. Basic Biology, Distribution and Vegetative Suppression of Four Knapweed Species. December 1993.
- 21. Idaho Pure Seed Law And Rules And Regulations Of Pure Seed Law. May, 1998.
- 22. Idaho Crop Improvement Association; Idaho Rules Of Certification. June, 1998.
- 23. How to Plant Willows and Cottonwoods for Riparian Rehabilitation. September 1993.
- 24. Improved Grass, Forb, Legume and Woody Seed Species for the Intermountain West. January 1997.

- 25. Function and Operation of a Machine to Lay Weed Barrier Material. October 1995.
- 26. PVP Plant Variety Protection Program for Conservation Plants. October 1995.
- 27. Plant Release Procedures, Cultivar-Tested-Selected-Source Identified. January 1996.
- 28. Glossary of Terms for use on Native Species Issues. October 1995.
- 29. Test Results Woody Plant Materials for Windbreaks. January 1996.
- 30. Perennial Ryegrass for Irrigated Pasture. October 1996.
- 31. Two-Year Results from Switchgrass Seeding Trial. October 1996.
- 33. Plant and Seed Vendors for Colorado-Idaho-Kansas-Montana-Nebraska-New Mexico-North Dakota-South Dakota-Utah-Wyoming. April 1997.

Wetland/Riparian Project Information Series

- 2. Selection and Acquisition of Woody Plant Species and Materials for Riparian Corridors and Shorelines.
- 3. Use of Willow and Cottonwood Cuttings for Vegetating Shorelines and Riparian Areas.
- 4. How to Plant willows and Cottonwood for Riparian Rehabilitation. (Short 4 page synopsis of Tech Note 23. For use as a handout to interested people.)
- 5. Collection, Establishment, and Evaluation of Unrooted Woody Cuttings to Obtain Performance Tested Ecotypes of Native Willows and Cottonwoods.
- 6. Seed and Live Transplant Collection Procedures for 7 Wetland Plant Species.
- 7. Use of Greenhouse Propagated Wetland Plants Versus Live Transplants to Vegetate Constructed or Created Wetlands.
- 8. Constructed Wetland System For Water Quality Improvement Of Irrigation Wastewater.

- 9. Design Criteria for Revegetation in Riparian Zones of the Intermountain Area.
- 11. Getting "Bang for your Buck" on your next Wetland Project.
- 12. Guidelines for Planting, Establishment, Maintenance of Constructed Wetland Systems.
- 13. A reference guide for the collection and use of ten common wetland plants of the Great Basin and Intermountain West.

Plant Fact Sheets

- 1. Nebraska Sedge, Carex nebrascensis
- 2. Creeping Spikerush, Eleocharis palustris
- 3. Baltic Rush, Juncus balticus
- 4. Hardstem Bulrush, Scirpus acutus
- 5. Alkali Bulrush, Scirpus maritimus
- 6. Common Threesquare, Scirpus pungens
- 7. Aberdeen Selection of Laurel willow, Salix pentandra

Plant Guides

- 1. Basin Wildrye, *Leymus cinereus*
- 2. Indian Ricegrass, Achnatherum hymenoides

Unpublished Regional & National Posters

- St. John, L. and P. Blaker. 1997. Recent Plant Releases from the Aberdeen Plant Materials Center. USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, ID. Poster Paper.
- Hoag, J. Chris. 1998. The Practical Streambank Bioengineering Guide: A User's Guide For Natural Streambank Stabilization Techniques In The Arid And Semi-Arid West. Interagency Riparian/Wetland Plant Development Project, USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, ID. Poster Paper.
- Hoag, J.C. 1998. Constructed Wetland System to treat water quality of wastewater poster paper. Idaho Nursery Association Horticultural Trade Show annual meeting, Boise, ID. January 23-24, 1998.

Workshops and Training Sessions

- * Multiple State Plant Materials Training Primarily for NRCS employees, but also provided to other federal, state, local and private individuals. A three day course with one and a half days in the classroom and one and a half days in the field. The course introduces the student to plant materials as an alternative to solve resource management problems, PMC functions, classes of seed, seed tags, fundamentals of seed production, planning a seeding, seed quality, seeding rates, seed mixtures, drill calibration, planting evaluations, use of rice hulls, seedbed preparation, and the integration of plant materials into field office activities. The PMC farms, ongoing projects and studies, and one off center test site are used to give the students a more practical training opportunity.
- * Bioengineering Workshops For NRCS employees, other federal, state and local agencies, and private landowners. A two-day course with one day in the classroom discussing riparian zone ecology, management, and restoration principles and the second day in the field installing a variety of bioengineering structures as alternatives to hard structures.
- * Wetland Creation and Enhancement Workshops For NRCS employees, other federal, state and local agencies, and private landowners who are interested in Constructed Wetland Systems or enhancement of existing wetlands. A two-day workshop with one day in the classroom reviewing wetland functions, hydrology, plants, plant establishment principles, and plant community maintenance. A second day is in the field planting wetland plants and looking at existing designs.

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